Homework #6

• Textbook:
  – Due: 1.7.10, 1.7.18, 1.7.34, 1.7.35, 1.7.36, 1.7.37, 1.7.39.

• Programming:

  1. Write a function in Matlab that takes as input a size $n$ and a tridiagonal matrix given as three vectors: $n \times 1$ vector $v$ representing the main diagonal, $(n - 1) \times 1$ vector $w$ representing the upper diagonal, and $(n - 1) \times 1$ vector $z$ representing the lower diagonal. Have this function output the $LU$ factorization with the $U$ as two vectors and the $L$ as one vector representing the diagonals. Also output the number of flops used. Use only basic programming.

    (a) Write out or print out your function.

    (b) Run the case with $n = 10$, $v$ the vector of 2’s, $w$ and $z$ the vector of $-1$’s. Write down your results for the diagonals of $L$ and $U$.

    (c) Run the case with $n = 50$ and $n = 100$ with $v$ the vector of 2’s, $w$ and $z$ the vector of $-1$’s. Write down your results for the number of flops used.